

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Review of the Commission's Rules Regarding	)	
the Pricing of Unbundled Network Elements	)	WC Docket No. 03-173
and the Resale of Service by Incumbent Local	)	
Exchange Carriers	)	
	)	
	)	
	)	

**REPLY DECLARATION OF DR. JAMES H. VANDER WEIDE SUBMITTED IN  
SUPPORT OF THE REPLY COMMENTS OF THE VERIZON TELEPHONE  
COMPANIES**

**I. Introduction**

1. My name is James H. Vander Weide. I previously submitted a declaration in this proceeding on behalf of The Verizon Telephone Companies (Verizon) on December 16, 2003. My previous declaration explained why: (1) the ILECs face four significant risks in providing UNEs, including competitive market risk, lease cancellation risk, sunk cost risk, and other regulatory risks related to TELRIC; (2) the ILECs will be unable to recover their forward-looking investment and expenses under the TELRIC standard; (3) lease cancellation risk, sunk cost risk, and other regulatory risks are not reflected in discounted cash flow (DCF) and capital asset pricing model (CAPM) estimates of the market cost of capital; (4) option pricing theory must be used to measure the required risk premium associated with lease cancellation and sunk cost risk; (5) the capital structure component of the weighted average cost of capital must be measured using market value rather than book value capital structure weights; (6) the cost of equity should be estimated by applying the single-stage DCF model to the S&P Industrials; and

(7) the cost of debt should be estimated by the current yield to maturity on A-rated industrial bonds.

2. In their initial filing in this proceeding, AT&T and MCI (the CLECs) filed six declarations and essays relating to risk and the cost of capital for use in UNE cost studies.<sup>1/</sup> The CLECs contend that: (1) the ILECs face little or no competition for UNE services; (2) increased competition does not increase the ILECs' investment risk; (3) the ILECs are able to fully recover all relevant economic costs of providing UNEs under current TELRIC rules; (4) traditional estimates of the market cost of capital already incorporate the impact of all investment risks; (5) the capital structure should be estimated using both book and market value capital structure weights; (6) the cost of equity should be estimated by applying the three-stage DCF model and the CAPM to the RBHCs; and (7) the cost of debt should be estimated from yield to maturity data on actual RBHC debt issues. As discussed below, these assertions are incorrect.

## **II. Summary**

3. From my review of the CLECs' declarations, I conclude that the CLECs have misunderstood the role of competition in the wholesale telecommunications market and UNE pricing, misstated the impact of this competition on estimates of the ILECs' betas, mischaracterized the types of risks that are included in DCF and CAPM estimates of the cost of equity, and misrepresented the ILECs' ability to recover their costs under the TELRIC standard. I also conclude that the CLECs' cost of capital recommendations are inconsistent with financial

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<sup>1/</sup> Declaration of Lee L. Selwyn on Behalf of AT&T Corp. (Dec. 16, 2003) ("AT&T Comments, Selwyn Decl."); Declaration of Terry L. Murray on Behalf of AT&T Corp. (Dec. 16, 2003) ("AT&T Comments, Murray Decl."); Declaration of Robert D. Willig on behalf of AT&T Corp. (Dec. 16, 2003) ("AT&T Comments, Willig Decl."); *Pricing Based on Economic Cost: The Role and Mechanisms of TELRIC* (Dec. 2003), essays by R. Glenn Hubbard & William H. Lehr ("AT&T Comments, Hubbard & Lehr Essay") and William J. Baumol ("AT&T Comments, Baumol Essay"); Declaration of Matthew I. Kahal on behalf of MCI (Dec. 16, 2003) ("AT&T Comments, Kahal Decl.").

and economic theory. There can be little doubt that if the Commission were to accept the CLECs' unsound recommendations, the ILECs would have little incentive to invest in network facilities and would not have an opportunity to recover their cost of providing UNEs, including their cost of capital.

4. The Cost of Capital Must Reflect Competitive Market Risk. As the Commission has already recognized, the underlying inputs, including the cost of capital, must reflect the assumption that the UNE market is competitive. That is particularly true where, as here, competition from a variety of sources abounds, and the risk of competition is widely recognized in the financial community. In particular, as Verizon has demonstrated, many customers now obtain telecommunications services over cable TV networks, wireless networks, the Internet, private enterprise networks, and the CLECs' own facilities. All of these substitute facilities compete directly with the ILECs' UNE services. Thus, the ILECs face extensive competition for UNE services in the wholesale market.

5. Contrary to CLECs' Claims, Increased Competition Does Increase Risk for Which Investors Require Compensation. The CLECs' argument that competitive risk is not relevant to investors is contradicted by evidence that capital market participants recognize the impact of competition on the ILECs' financial performance, and their stock buy and sell decisions reflect this information. Financial analysts' reports on telecommunications companies are dominated by discussions of the risks associated with competitive developments in the industry, including the impact of current UNE pricing rules. There would certainly be no need to discuss competitive market risk if this information were irrelevant to investors. Furthermore, the CLECs' argument is based on a conclusion of the Capital Asset Pricing Model that investors should only be compensated for systematic risk. This conclusion of the CAPM is contradicted

by widespread evidence that stock prices respond to both systematic (*i.e.*, macroeconomic) and company specific risk.

6. The CLECs attempt to support their argument that competition is not a source of increased risk through an empirical study of the relationship between the RBHCs' beta values and the level of facilities-based competition. The CLECs conclude from their study that higher RBHC betas are caused by the increased percentage of non-ILEC investment on their balance sheets rather than from increased competition. However, the CLECs' study is characterized by several statistical flaws. Once these flaws are corrected, the CLECs' study produces the opposite result, that increased competition is associated with higher betas.

7. The Capital Structure Component of UNE Costs Must Be Measured Using Market Values. The CLECs argue that the capital structure component of the UNE cost of capital must be measured at least in part by using the book values rather than the market values of the RBHCs' debt and equity. Since the Commission is well aware that book values reflect historical, embedded, and accounting costs, it should come as no surprise that the CLECs' recommendation to use book values is inconsistent with the Commission's fundamental tenet that UNE rates should be based on forward-looking economic costs. The CLECs' recommendation to measure the capital structure component using book values of debt and equity also is inconsistent with financial theory and practice. A company's capital structure must be measured in terms of market values because market values best reflect the amounts of debt and equity investors have invested in the company, and decision makers make decisions on the basis of market values, not accounting or book values. Furthermore, since investors can only buy securities at market value, they expect to earn their required rate of return on the market value of their investment, not the book value.

8. The RBHCs Are Not an Appropriate Proxy for the Purpose of Estimating the Cost of Capital. The CLECs recommend that the RBHCs be used as a proxy group for the purpose of estimating the UNE cost of capital. The Commission should reject the CLECs' proposal to use the RBHCs as proxies for several reasons. First, the RBHCs are less risky than a UNE investment because the RBHCs can diversify away many of the risks facing the UNE business, including technology risk, geographic risk, and regulatory risk. Furthermore, the rates of the RBHCs' other services are not based on a regulatory standard that precludes them from earning their cost of capital. Second, the three remaining dividend-paying RBHCs are too small a sample for the purpose of reliably estimating the cost of equity. Economists recognize that the random noise associated with most cost of equity estimates can be significantly reduced by applying cost of equity methodologies to a large sample of proxy companies. Third, traditional cost of equity models are based on the assumption that the target company operates in a stable environment where investors can reasonably predict future rates of return and risk. Thus, traditional cost of equity models cannot be reliably applied to companies such as the RBHCs that are experiencing a dramatic industry restructuring that threatens the historic core of their business, wireline telephony. Fourth, the use of the RBHCs as proxies produces circular results. The RBHCs' expected growth rates have declined drastically because the Commission's TELRIC rules require the RBHCs to lease network elements to competitors at below-cost rates. The lower expected growth of the RBHCs further reduces their DCF results.

9. The Single-Stage DCF Model Should Be Used to Estimate the Cost of Equity. The CLECs recommend that the three-stage DCF model, rather than the single-stage DCF model, should be used to measure the cost of equity component of UNE costs. The Commission should recognize that the CLECs' three-stage DCF model produces results that are inconsistent

with the fundamental economic principle of risk and return. Specifically, the CLECs' three-stage DCF model produces the contradictory result that higher-risk companies have lower required rates of return, and lower risk companies have higher required rates of return. Any model that produces these incongruous results can not be used to estimate the cost of equity capital. In contrast, the single-stage DCF model produces results that are consistent with the risk/return principle: namely, higher risk companies have higher rates of return than lower risk companies. In addition, the three-stage DCF model inherently requires more uncertain estimates of input values than the single-stage model. As the Wireless Competition Bureau correctly concluded in the Virginia arbitration proceeding, "there are an unlimited number of different growth rate estimates that could be used in such a DCF model" and "no basis on which to find" that any particular proposal will produce a reasonable figure.<sup>2/</sup>

10. The CAPM Should Not Be Used to Estimate the Cost of Equity. As an alternative to the three-stage DCF model, the CLECs recommend that the cost of equity can be estimated using the CAPM. However, by focusing on only a single dimension of risk, the sensitivity of a company's stock to variations in the market as a whole, the CAPM fails to capture the many dimensions of risk that, in reality, investors consider.<sup>3/</sup> In addition, the CAPM requires a measure of risk, the beta factor, which can only be measured using *historical* data. In industries such as telecommunications that are experiencing dramatic structural change, the beta factor will necessarily underestimate the risk of investment on a forward-looking basis. Furthermore, the

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<sup>2/</sup> Memorandum Opinion and Order, Petition of Worldcom, Inc. Pursuant to Section 252(e)(5) of the Communications Act for Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon Virginia Inc., and for Expedited Arbitration, et al., CC Docket Nos. 00-218, 00-249 and 00-251, ¶ 75 (2003) ("Virginia Arbitration Order").

<sup>3/</sup> Although as I describe below the DCF does not capture risks associated with options and regulatory risks, it does reflect normal competitive risks.

CAPM requires another input, the estimate of the risk premium on the market portfolio, which is not based on objective data such as analysts' growth forecasts used by investors. Finally, the CLECs recommend input values for application of the CAPM that are unsupportable and that would produce cost of equity estimates that are significantly below investors' return requirements.

11. The Cost of Debt Should Be Measured Using the Current Yield to Maturity on A-Rated Industrial Bonds. The CLECs argue that a large portion of short-term debt should be included in the capital structure in cost of debt calculations. The CLECs' argument reflects a basic misunderstanding of how the ILECs finance their investments and of how UNE costs are calculated. The ILECs primarily use short-term debt to finance working capital requirements, and working capital is not included in the investment component of UNE costs. Thus, short-term debt should not be included in the capital structure and cost of debt calculations.

12. Lease Cancellation and Sunk Cost Risk Are Not Included in Estimates of the Market Cost of Capital. The CLECs assert that the Commission can ignore lease cancellation and sunk cost risks because these risks are already included in market estimates of the cost of capital. However, their argument reflects a basic misunderstanding of the economics of traditional methods of estimating the cost of equity. As I described in my initial declaration, traditional cost of equity methodologies such as the DCF and CAPM do not reflect lease cancellation and sunk cost risk because these risks arise from the presence of options whose value is not included in the DCF and CAPM equations. That the DCF and CAPM equations do not include the value of real options is widely recognized in the financial literature. Indeed, it was this failure that led scholars such as Black and Scholes to investigate alternative formulas for valuing option contracts.

13. The TELRIC Standard Precludes the ILECs from Recovering their Forward-looking TELRIC Costs. In my initial declaration, I presented incontrovertible evidence that the ILECs will not be able to recover their forward-looking economic cost of providing UNE service under the TELRIC standard. As I discussed, this conclusion is also supported by a working paper co-authored by FCC economist Dr. Sharkey. The CLECs attempt to refute the conclusion that TELRIC precludes the ILECs from recovering their forward-looking economic costs by presenting a simple static example that fails to capture the dynamic economics of real world investment decisions. Indeed, the CLECs' argument rests on the fallacious assumption that all ILEC network investments have already been made, and thus the ILECs have no opportunity to recognize the value-decreasing implications of the Commission's TELRIC rules before they invest in network facilities. However, contrary to the CLECs' assumption that all ILEC network investments have already been made, UNE cost models are based on the assumption that all network investments and expenses are *forward looking*. The ILECs certainly recognize before they make investment decisions that TELRIC provides them no opportunity to recover their initial investment and expenses. Because they recognize the negative implications of TELRIC before they make investment decisions, the ILECs currently have a strong incentive to reduce or forego further investment in their networks.

### **III. The Cost of Capital Should Reflect Competitive Market Risk.**

14. In this proceeding, the CLECs are seeking to overturn the Commission's ruling in the *Triennial Review Order* that the cost of capital input must reflect competitive market conditions.<sup>4/</sup> In contrast to the Commission's reasoned decision, the CLECs irrationally argue

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<sup>4/</sup> Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, 18 FCC Rcd 16978, 17396 ¶ 680 (2003) ("*Triennial Review Order*").



that the cost of capital input should reflect the assumption that UNEs are offered in a low-risk monopoly environment. The CLECs seek to bolster their unreasonable position with specious arguments. First, they argue that the assumption of a competitive market is not required for consistency, because TELRIC is based on the assumption of contestable markets, not competitive markets. *See* AT&T Comments, Murray Decl. ¶¶ 52-53; AT&T Comments, Willig ¶¶ 23, 111. Second, they claim that ILECs do not face competitive risks because competition for telecommunications services allegedly exists only at the retail level, not at the wholesale level, *see* AT&T Comments, Murray Decl. ¶¶ 63-64; AT&T Comments, Willig Decl. ¶ 114 n.21, and the Commission's impairment standard supposedly guarantees that the ILECs will never face competition for the UNEs they are required to offer, *see* AT&T Comments, Selwyn Decl. ¶¶ 3, 29-35; AT&T Comments, Murray Decl. ¶ 42; AT&T Comments, Willig Decl. ¶ 128. These arguments are not defensible.

**A. Consistency Requires That the Cost of Capital Input Be Based on Competitive Market Risk.**

15. The CLECs now challenge the Commission's ruling that the cost of capital must assume a competitive market by claiming that TELRIC is based on the assumption of a perfectly "contestable" market, not a competitive one.<sup>5/</sup> But the cost of capital for a company whose rates are based on the theory of perfectly contestable markets would be just as high, if not *higher*, than the cost of capital for a company whose rates are based on the theory of competitive markets. The theory of competitive markets only requires the assumption that economies of

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<sup>5/</sup> First Report and Order, Implementation of the Local Competition Provision in the Telecommunications Act of 1996, 11 FCC Rcd 15499, 15857-58 ¶ 738 (1996) ("*Local Competition Order*"); *see also id.* at 15846-47 ¶ 679 ("Adopting a pricing methodology based on forward-looking, economic costs best replicates, to the extent possible, the conditions of a competitive market . . . Because a pricing methodology based on forward-looking costs simulates the conditions in a competitive marketplace, it allows the requesting carrier to produce efficiently and to compete effectively . . .").

scale are insufficient to preclude multiple facilities-based competitors from earning a profit. The CLECs' definition of a contestable market requires the assumption that potential competitors can enter the market without incurring *any* sunk costs — that is costless entry (and exit). AT&T Comments, Willig Decl. ¶¶ 24-31. This, of course, is utterly inconsistent with the realities of a telecommunications market, which by its very nature requires very high sunk costs. As I explain in my initial declaration, if UNE rates are based on the assumption that there are no sunk costs, when, in fact, there are, the ILEC will not have an opportunity to recover its forward-looking economic costs.<sup>6/</sup> Moreover, if in fact such a market existed, the risks faced by the incumbent provider would be enormous: under the assumption of a perfectly contestable market, an incumbent would have to make significant investments even while knowing that any moment a new entrant could immediately and costlessly enter and take the incumbent's customers if a new technology or other development allowed the entrant to offer service at even a very slightly lower cost. Such a market would impose even greater risks on the incumbent than simply operating in a real-world competitive market with other facilities-based competitors.

**B. ILECs Face Extensive Competition for UNE Services.**

16. The cost of capital also must reflect the risks of a competitive market because, as Verizon's comments demonstrate, incumbents in fact face significant competition particularly from intermodal sources, which is likely to increase going forward. *See* Verizon Comments at 68-73. The CLECs first try to refute this fact by claiming that competition for telecommunications services exists only at the retail level, not the wholesale level. But that

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<sup>6/</sup> I discussed the additional risks an incumbent would face when UNE rates are based on the theory of contestable markets in response to a question from Mr. Schneider in the Virginia arbitration proceeding. In their initial declarations, CLEC witnesses Murray and Willig completely mischaracterize my testimony, alleging that I accepted the theory of contestable markets. Indeed, Prof. Willig attributes a quote to me that was actually a quotation from MCI's attorney Mr. Schneider. AT&T Comments, Willig Decl. ¶ 115 n. 22.

misses the point. Competition through intermodal facilities is a clear competitive threat to the UNE business, since demand for wireline services — and thus the need for UNEs — will be measurably reduced as customers migrate to those intermodal competitors. Thus, UNEs are affected by facilities-based competition from cable TV companies, wireless companies, and companies that provide VoIP. The UNE business is also competitively threatened by facilities-based competition from CLECs that use their own switches and/or loops to provide telecommunications services to business and residential customers.

17. The CLECs next argue that, when the Commission found that CLECs are “impaired” without access to the UNEs that still must be unbundled following the *Triennial Review Order*, the Commission necessarily concluded that it does not believe a competitive wholesale market does or can exist for such elements. This is irrational and disingenuous. First, the Commission expressly rejected the notion that evidence of competition would necessarily support a finding of no impairment, and thus even for those UNEs where the Commission *has* found impairment, there might very well already be existing competition. *See Triennial Review Order* 17042-43, ¶ 94 (“[E]vidence [of competition] may indicate a lack of impairment, [but] we disagree with commenters that argue that such evidence is dispositive or creates a rebuttal presumption of no impairment.”) Second, even where competition does not exist today, that is not tantamount to a finding by the Commission that competition cannot develop; whether it does or does not ultimately is an empirical issue. Finally, of course, intermodal and facilities-based intramodal competition can make UNEs obsolete by allowing bypass of the incumbent’s network facilities; it thus is irrelevant whether there is wholesale competition for a particular UNE that remains on the unbundling list. Verizon has presented extensive evidence demonstrating that competition for wholesale services exists and is growing rapidly. *See Verizon Comments* at 19-

34. On the basis of this evidence, there can be no doubt that UNEs are subject to substantial competition.

**IV. Contrary to CLEC Claims, Increased Competition Does Increase Risk for Which Investors Require Compensation.**

**A. Investors Demand Increased Returns for Companies Facing Greater Competitive Risk.**

18. The CLECs next argue that the cost of capital input should not reflect specific competitive market risks faced by UNE providers because investors are able to balance out or eliminate those risks through diversification of their portfolios. Specifically, the CLECs claim that investors are only concerned about “systemic” or macroeconomic risks, because these are the only ones that cannot be diversified away, and they suggest that the “systemic” risk faced by UNE companies is very low because, even in economically lean times, consumers would still need basic phone service. AT&T Comments, Selwyn Decl. ¶ 3; AT&T Comments, Murray Decl. ¶¶ 58-60. But this argument — which is also the basic assumption underlying the CAPM — generally does not reflect how investors behave in real world capital markets.

19. Indeed, the CAPM, which is built on this theory, requires a host of restrictive assumptions that are entirely unrealistic. For example, the CAPM assumes that investors only care about the means and variances of returns on investment and that financial markets are frictionless in the sense that there are no transactions costs, no bankruptcy costs, no regulations that affect investors’ ability to buy and sell securities, and no tax consequences of asset purchases or sales. Furthermore, the CAPM ignores the many behavioral influences on investors’ views of risk and the required rate of return. When these limitations of the CAPM are considered, the conclusion of the CAPM that investors need not be concerned with individual company risks should be modified.

20. Real world investors simply do not evaluate investment risk in the simplistic way

the CLECs suggest and the CAPM assumes. Rather, real-world investors need to be compensated for competitive market risks, a conclusion supported by several forms of evidence. First, financial scholars have found that data such as a specific company's size and market-to-book ratio provide better explanations of security returns than betas, which measure the risks due to changes in the market as a whole.<sup>7/</sup> Second, when financial analysts assess investment risk, they invariably include both individual company characteristics as well as general economic characteristics. For example, the Value Line safety rank is computed "by averaging two other Value Line indexes—the price stability index and the financial strength rating." *How to Invest in Common Stocks: a Guide to Using the Value Line Investment Survey* at 40. The price stability index includes individual company stock volatility as well as sensitivity to the market as a whole, and the financial strength rating considers only unique company characteristics. Third, investors have a natural aversion to investing in a company when they expect a company's stock to decline. To induce investors to invest in such a company, they must be compensated for the risks of the stock's possible decline.

21. Furthermore, securities analysts' reports on individual companies — which obviously cater to investors — are dominated by analyses of competition. Moreover, analysts' buy and sell recommendations generally reflect their conclusions about the effects of competition in particular. If investors were unconcerned with the risks of competition, analysts would soon learn to spend little time investigating a company's competitive landscape.

22. Thus, the CLECs' suggestion that the cost of capital need not address the UNE-specific competitive risks runs counter to the way investors themselves would consider the risk of investing in a UNE company. Their proposed approach accordingly would produce UNE

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<sup>7/</sup> See, for example, Eugene Fama and Kenneth French, "The Cross-Section of Expected Returns," *Journal of Finance* (June 1992), pp. 427-465.

rates that were too low to allow the incumbent to provide its investors with the return they would in fact demand based on their much higher, real-world evaluation of the relevant risks.

**B. RBHC Betas Have Increased with Increasing Competition.**

23. The CLECs next argue that, even if competitive risk matters to investors, the individual risk for UNE companies (or wireline companies) is very low. Although the RBHCs' betas have been increasing over the past several years, reflecting the fact that those companies are increasingly riskier than the average company, the CLECs contend that they have performed a study that demonstrates that this is not a result of competition. Their study considers the relationship between the RBHCs' betas and three economic factors: the level of facilities-based competition, the percentage of the company's assets in non-ILEC businesses, and the degree of leverage. They contend that their analysis shows that the increase in RBHC betas from the second half of 2000 to the first half of 2003 was caused by an increase in the RBHCs' average investment in non-ILEC (wireless and broadband) assets, *not* by an increase in competition. AT&T Comments, Selwyn Decl. ¶¶ 36-59.

24. My analysis of the CLECs' study indicates that it is fundamentally flawed. First, as shown below in Table 1 (which is a copy of Dr. Selwyn's exhibit titled, "Data Underlying Exhibit 1"), a significant portion of the increase in beta values and the percentage of non-ILEC assets found on the RBHCs' balance sheets in the CLECs' study is associated with just two observations: the "Qwest" observations for the second half of 2000 ("2H00" in Table 1) and the first half of 2001, following the merger of U S WEST with Qwest ("1H01" in Table 1). These observations are highly unusual in that, as shown in the table, the beta value for Qwest increased from 0.75 in 2H00 to 1.60 in 1H01, while the percentage of non-ILEC assets increased from 0.1415 to 0.6892 (that is, from approximately 14% to 69%) in just a six-month period. Since beta values are measured using five years of monthly historical data, it is highly unlikely that a

company's beta could have increased from 0.75 to 1.60 in a six-month period. It is also unlikely that a company's percentage of non-ILEC assets would increase from 14% to 69% in a six-month period simply through internal expansion.

25. In fact, "Qwest's" beta and percentage of non-ILEC assets did not increase by these amounts in that six-month period. Rather, the increase in beta from 0.75 to 1.60 was not associated with one company. The 0.75 beta at the second half of 2000 was actually based on five years of historical data for "US West," (US West and Qwest merged in the June 2000), while the 1.60 beta at the first half of 2001 was based on five years of historical data for the pre-merger company "Qwest," a company that had invested billions of dollars in building a national fiber optic network. Similarly, the 0.1415 percentage of non-ILEC assets was associated with "US West," whereas the 0.6892 percentage of non-ILEC assets was associated with the newly-merged Qwest/US West. Thus, the two data points are not comparable and do not even relate to the same company and should not have been used to examine whether the ILECs' percentage of non-ILEC assets was a factor in causing the RBHCs' betas to increase. After all, Qwest was not an ILEC at all in the second half of 2000, and its beta value certainly did not reflect the impact of ILEC assets.

**Table 1**  
**Dr. Selwyn's Data Underlying his Regression Analysis**  
**("Data Underlying Exhibit 1")**

Company	Year	Beta	FB_Comp	Non_ILEC	Leverage
BellSouth	1H00	0.825	0.0186	0.4719	0.1593
BellSouth	2H00	0.825	0.0207	0.4260	0.1967
BellSouth	1H01	0.825	0.0238	0.4170	0.2108
BellSouth	2H01	0.800	0.0260	0.3868	0.1931
BellSouth	1H02	0.775	0.0192	0.3861	0.2244
BellSouth	2H02	0.850	0.0199	0.3670	0.3141
BellSouth	1H03	0.900	0.0240	0.3641	0.2557
<b>Qwest</b>	<b>2H00</b>	<b>0.750</b>	<b>0.0122</b>	<b>0.1415</b>	<b>0.2582</b>
<b>Qwest</b>	<b>1H01</b>	<b>1.600</b>	<b>0.0255</b>	<b>0.6892</b>	<b>0.2458</b>
Qwest	2H01	1.475	0.0322	0.6644	0.4206
Qwest	1H02	1.475	0.0393	0.6603	0.6490
Qwest	2H02	1.675	0.0449	0.6557	0.8614
SBC	1H00	0.825	0.0124	0.4096	0.1274
SBC	2H00	0.850	0.0208	0.4317	0.1391
SBC	1H01	0.825	0.0276	0.4514	0.1542
SBC	2H01	0.800	0.0296	0.4872	0.1452
SBC	1H02	0.775	0.0326	0.5077	0.1692
SBC	2H02	0.900	0.0342	0.4792	0.2557
SBC	1H03	0.975	0.0351	0.5215	0.2366
Verizon	1H00	0.850	0.0171	0.3184	0.1773
Verizon	2H02	1.025	0.0480	0.5390	0.4349
Verizon	1H03	1.000	0.0478	0.5415	0.3680

(*"1H00" means first half of 2000; "2H00" means second half of 2000.*)

26. A slightly more relevant comparison might have been to compare the data for Qwest for both time periods — pre- and post-merger — for the second half of 2000 and the first half of 2001). Table 2 shows the data for this comparison. It is immediately obvious when these data are compared that the Qwest beta stayed approximately the *same* from the second half of 2000 to the first half of 2001, even though the company's percent of non-ILEC assets declined from 100% to 68.92%, and, hence, its percentage of ILEC assets increased from 0% to 31.08%. One could conclude from these data that, since the decrease in broadband assets had no effect on Qwest's beta, the broadband assets are at a minimum no *riskier* than the ILEC assets. In truth, however, it is impossible to draw any reliable conclusion, because the beta values represent five



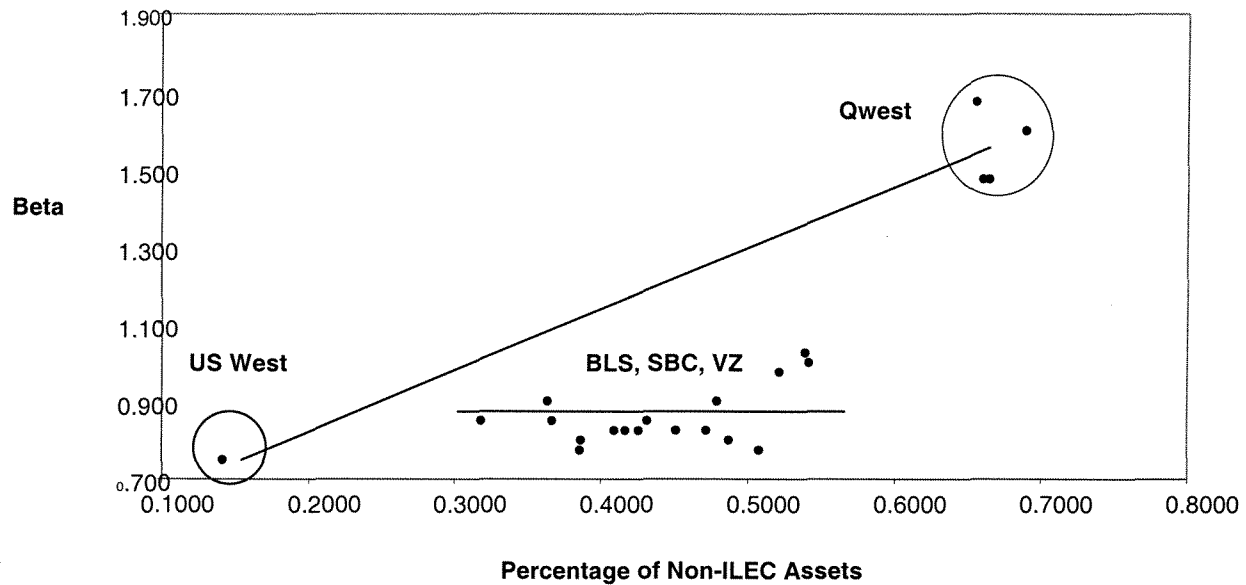
years of historical data. Thus, the sudden increase in ILEC and decrease in non-ILEC assets is not likely to impact the beta estimate for many months.

**Table 2**  
**Qwest Data Second Half 2000 and First Half 2001**

Time	Beta	% Non-ILEC Assets	ILEC Assets
2H00	1.625	100.00%	00.00%
1H01	1.600	68.92%	31.08%

27. Having determined that the “Qwest” data for the second half of 2000 should have been excluded from the CLECs’ study, I sought to determine what effect the inclusion of this incongruous data had on the CLECs’ results. As a first step in this examination, it is helpful to review the scatter plot shown below in Figure 1. This figure depicts how the Qwest values for beta and percentage of non-ILEC assets compare to the values for BellSouth, SBC, and Verizon. Clearly, the Qwest values are outliers. Moreover, even a casual observer can see that there is no relationship between beta and percentage of non-ILEC assets for BellSouth, SBC, and Verizon (see the horizontal line through the data for BellSouth, SBC, and Verizon). In contrast, there is a very strong positive relationship between beta and the percentage of non-ILEC assets for Qwest, which arises solely from the incongruous US WEST data in the lower left corner of the graph (demonstrated by the upward sloping line). Thus, the inclusion of US West data for the second half of 2000 clearly biased the CLECs’ results.

**Figure 1**  
**Scatter Plot of CLEC Data Points**



28. The impact of the inclusion of the incongruous US WEST data point can be quantified by re-running the CLECs' regression without this data point. The results, which are shown in Table 3 below, indicate that once the US WEST observation is removed, the percentage of non-ILEC assets and the percentage of debt in the ILECs' capital structure have no significant impact on beta values over the period.

**Table 3**  
**CLEC Regression Results without Incongruous US WEST Data Point<sup>8/</sup>**

	Standardized Coefficient	t	Sig.
(Constant)		7.019	.000
<b>Non-ILEC assets</b>	<b>.134</b>	<b>.896</b>	.396
QWEST	.785	3.760	.006
SBC	-.106	-1.526	.165
BellSouth	-.114	-1.308	.227
<b>Facilities Competition</b>	<b>-.027</b>	<b>-.154</b>	.881
2H00	.019	.454	.662
1H01	.027	.415	.689
2H01	-.043	-.563	.589
1H02	-.074	-1.164	.278
2H02	.110	1.574	.154
1H03	.127	1.816	.107
<b>Leverage</b>	<b>.048</b>	<b>.347</b>	.737
Dependent variable:	Beta		

29. Second, the CLECs inappropriately define competition solely by the percentage of lines served by facilities-based wireline competitors. These data do not reflect the impact of facilities-based intermodal competition from wireless carriers, cable TV providers, private networks, and Internet companies, nor do they reflect the rapid increase in UNE-P competition that followed state-authorized UNE rate reductions in 2002. Judging from comments in the financial press, it is likely that the financial community increased its estimate of the RBHCs' risk in late 2002 because state commissions were seen as setting UNE rates at levels below the RBHCs' actual forward-looking costs of providing UNEs. *See* Declaration of Thomas W.

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<sup>8/</sup> The time and company variables in the left-hand column of this table are dummy variables that control for differences in time and company. The important coefficients for the purposes of the CLECs' conclusions are: (1) non-ILEC assets; (2) facilities competition (labeled "FB\_Comp in the CLECs" data shown in Table 1); and (3) leverage. The insignificance of the coefficients for these three variables is indicated by the fact that their associated t values are less than 2.

Hazlett et al ¶ 16 (Dec. 16, 2003) (“Hazlett Decl.”).

30. To examine whether the CLECs’ conclusion that competition had no impact on beta values was affected by their definition of competition, it is appropriate to re-run the CLECs’ regressions using total CLEC lines as a measure of competition. As shown in Table 4, when competition is defined using total CLEC lines rather than only facilities-based lines and the first US WEST/Qwest observation is removed, the competition variable is now positive and significant at the 10% level, while the percent of non-ILEC assets and leverage variables are insignificant.<sup>2/</sup> And even that correction does not reflect the effects of intermodal competition.

**Table 4**  
**CLEC Regression Results Using Total Competition as an Explanatory Variable**

	Unstandardized Coefficient	Std. Error	Standardized Coefficient	T	Sig.
(Constant)	.890	.134		6.623	.000
Non-ILEC Assets	-.563	.501	-.210	-1.124	.281
Competition	3.799	1.952	<b>.438</b>	<b>1.946</b>	.074
QWEST	.892	.175	1.236	5.113	.000
SBC	5.992E-03	.075	.010	.080	.938
BellSouth	1.616E-02	.078	.027	.207	.839
Leverage	-.214	.146	-.139	-1.461	.168
Period	-2.023E-02	.021	-.142	-.955	.357
Dependent Variable:	Beta				

31. Third, the CLECs use the results of their regression study to support their assertion that the ILEC business is significantly less risky than the RBHCs’ total businesses; they argue that this proves that a beta of 0.75, rather than the RBHCs’ beta of 1.0, should be used in cost of capital studies. In particular, the CLECs recommend a 0.75 beta based on their

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<sup>2/</sup> In particular, .074 under the column labeled “Sig.” indicates that there is only a probability of 7.4% that there is no relationship between competition and beta.

observation that US WEST had a beta of 0.75 in 1997 after its divestiture of certain cable assets. AT&T Comments, Selwyn Decl. ¶ 57.

32. But as I have shown, using the CLECs' own study, the percentage of non-ILEC assets has no impact on beta. Since the CLECs' 0.75 beta conclusion is based on their incorrect finding that the percentage of non-ILEC assets explains the observed increase in beta, the Commission should also reject the CLECs' recommendation to use a 0.75 beta derived from their lone example using US WEST data from 1997.

33. In addition to being based on a false premise, the CLECs' recommended 0.75 beta is also based on data that is now nearly seven years old and is based on only a single company. Since both the S&P Industrials and the RBHCs have a beta of 1.0, the Commission should use a beta of *at least* 1.0 if it uses the CAPM model at all, just as the Wireline Competition Bureau did.

**V. The Capital Structure Component of the UNE Cost of Capital Must Be Measured Using Market Weights of Debt and Equity.**

34. The Commission has stated clearly that UNE rates must be based on forward-looking economic costs, not historical, accounting or embedded costs. A capital structure based on the market values of debt and equity is the only capital structure that reflects forward-looking economic costs.<sup>10/</sup> See *e.g.*, *Local Competition Order* at 15844 ¶ 673.

35. The use of a market value-based capital structure is also the only alternative that is consistent with financial and economic theory. Financial theory requires the use of market value weights to calculate the weighted average cost of capital because debt and equity can only be sold at market value, not book value. The cost of equity, for example, is the *expected* rate of return from the purchase of stock at the current market price. It is not the return on book value

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<sup>10/</sup> Economic costs reflect the market values of a company's assets, and hence the market values of its debt and equity.

per share. UNE rates will only allow investors an opportunity to earn their required rate of return on the market value of equity if the UNE cost of capital is calculated using market value percentages of debt and equity in the capital structure.

36. In their initial declarations, the CLECs attempt to refute the logic of using a market value capital structure through several untenable arguments. First, they argue that the cost of capital should be based on a “target” capital structure, not a market value capital structure, and they assert that the former term includes consideration of book value. *See* AT&T Comments, Murray Decl. ¶ 111. Second, they argue that a market value capital structure is not needed to maintain access to capital markets on favorable terms. *See* MCI Comments, Kahal Decl. at 8. Third, they use historical and forecasted data on book value capital structures to argue that U.S. industrial firms have financed their investments historically with a mix of debt and equity that approximates current book value capital structures. *Id.* at 9-10. Fourth, they argue that financial research supports the conclusion that the market value of equity tends to move toward book value in the long run. *See* AT&T Comments, Murray Decl. ¶ 115. Fifth, they contend that the RBHCs’ market value capital structures should not be used for the UNE business because the RBHCs are riskier than the UNE business. *See* AT&T Comments, Willig Decl. ¶¶ 128-129. Finally, they argue that market values cannot be trusted because they are too volatile.<sup>11/</sup> *See* AT&T Comments, Murray Decl. ¶ 111.

**A. The Commission Should Use a Target Market Value Capital Structure, Not a Target Book Value Capital Structure.**

37. The simple logic behind the requirement to use market value capital structure weights in estimating the weighted average cost of capital is that: (1) market values measure the

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<sup>11/</sup> I will not address these last two claims here. I addressed the claim that the RBHCs are more risky than the UNE business in Section IV above. I rebutted the claim that market values are too volatile on p. 35 of my initial declaration.

forward-looking economic value of the investment in the firm; (2) the investors' required rate of return, and thus the firm's cost of capital, is based on the market value of the investment; (3) investors can only earn their required rate of return on investment if the weighted average cost of capital is based on market values; and (4) the ILEC will not be able to attract investors if investors do not have an opportunity to earn their required rate of return on investment. Thus, the Commission can only send correct economic signals to investors if the weighted average cost of capital is based on a market value capital structure rather than a book value capital structure.

38. When economists refer to a firm's market value capital structure, they sometimes refer to a firm's *target* market value capital structure. However, when economists use the word "target," they are still referring to a market value capital structure, not a target book value capital structure. The word "target" only reflects economists' awareness that a firm's optimal capital structure may differ from its current market value capital structure, and the firm may raise capital over time at changing market values. For example, Ross and Westerfield state:

The weights we used in the previous example were market value weights. The use of market value weights is based on the assumption that the company's existing capital structure is optimal and will be maintained in the future. Market value weights are more appropriate than book value weights because the market values of the securities are close to the actual dollars that would be received from the sale.

The firm may have an optimal capital structure, in which case it would have "target" weights. If a firm has determined that a particular capital structure is most consistent with its objective to maximize shareholder wealth, the use of the target weights may be appropriate—even if the firm is not currently at its optimal capital structure. The use of target weights is appropriate if the firm will reach its target capital structure in the future.

Stephen A. Ross, Randolph W. Westerfield, *Corporate Finance*, 1988, p. 218. It is clear that Ross and Westerfield are referring to target *market value* weights, not target book value weights. It is also clear that the prevailing assumption would normally be that the current market value weights are optimal, especially if those market value weights have been relatively constant over

time, as they have in both the case of the S&P Industrials and the RBHCs. Indeed, the CLECs' claim that current market structures will move toward AT&T's assumed target over time, *see* AT&T Comments, Murray Decl. ¶¶ 114-116, is contrary to both the fact that the market weights for these companies have remained stable over time and that the S&P Industrials operate in fully competitive markets and are clearly efficient, yet their capital structures are nowhere near the "target" the CLECs assume.

39. The CLECs have inappropriately seized on economists' use of the phrase "target capital structure" to support their recommendation that the Commission should use a *book value* capital structure to set UNE rates, implying that a *book value* capital structure more closely approximates a company's target capital structure than a market value capital structure. For example, Ms. Murray uses the word "target" to support her contention that BellSouth's and Sprint's "target" 60% equity/40% debt regulatory book value capital structures should be used by the Commission to set UNE rates. AT&T comments, Murray Decl. ¶ 117. The Commission should reject Ms. Murray's inappropriate mixing of target market value capital structures and target book value capital structures.

**B. A Market Value Capital Structure Is Required to Maintain Access to Capital Markets.**

40. As discussed above, the use of a market value capital structure to estimate the weighted average cost of capital for UNE cost studies is required because investors can only earn their required rate of return on the market value of their investment if rates are set using market values of debt and equity in the capital structure. Access to the capital markets can only be maintained when a company provides investors an opportunity to earn their required rate of return. Since required returns are measured on the basis of the market values of investments — not the book values — the Commission must use market values to send correct economic signals



to investors.

41. Rather than referring to investors' opportunity to earn their required rate of return on investment, the CLECs argue that access to the capital markets can only be assured by maintaining a proper interest coverage ratio. *See* MCI Comments, Kahal Decl. at 7-9. But while interest coverage ratios may have some relevance for the purpose of bond ratings, they have no relevance whatsoever for the purpose of setting the required rate of return on investment. Furthermore, in referring to interest coverage ratios, the CLECs inappropriately assume that the ILECs will be able to earn whatever return they are granted. But, as I have shown, the ILECs have no opportunity to earn their required rate of return under the TELRIC standard. Declaration of James H. Vander Weide Submitted in Support of the Comments of the Verizon Telephone Companies ¶¶ 29-38 (Dec. 16, 2003) ("Vander Weide Decl.").

**C. Book Value Capital Structure Data Do Not Provide Information on How Firms Incrementally Finance Their Investments.**

42. Market value weights are appropriate, at least in part, because market values approximate the actual dollars that would be received from the sale of debt and equity securities. CLECs have attempted to use historical and forecasted data on book value capital structures to suggest that industrial companies finance their investments with a mix of equity in the 50% to 60% range. *See* MCI Comments, Kahal Decl. at 8–12. The CLECs’ book value data reflect the industrial companies’ *historical* costs and accounting policies, however, not their forward-looking financing mix. Companies can only *sell* securities at market values, not book values, and thus their forward-looking financing mix must be measured using market values. Furthermore, the market value of a company’s securities reflects the market value of its assets, not the book value of those assets. Thus, book value data, whether historical or forecasted, is inherently incapable of providing information on the industrial companies’ forward-looking financing policies.

43. The CLECs concede that the *market value* capital structure of the industrial companies they analyze contains more than 81% equity. However, they dismiss this evidence as irrelevant, based on the following statement:

However, this market-based capital structure is largely driven by stock prices. This alone tells us very little about how companies in competitive markets raise capital to fund new investments, which is what TELRIC requires.

MCI Comments, Kahal Decl. at 10. But the CLECs are incorrect: competitive companies raise capital at market values, not book values. Thus, the market-based capital structure is the most appropriate measure of how companies raise capital to fund new investments. Furthermore, since investors’ required rates of return are based on the market values of their investments, that is the only measure of capital structure that could have any relevance under an appropriate

forward-looking costs analysis.

44. As a final matter, it is worth noting that even the book value capital structure data presented by the ILECs are erroneous. Those data are significantly biased by the inclusion of companies such as Ford, General Motors, and Sears, which have heavily-leveraged capital structures as a result of their consumer finance activities. Their capital structures accordingly more closely resemble the capital structure of financial institutions rather than that of other industrial companies. For example, Ford has 97% debt, General Motors more than 96% debt, and Sears more than 82% debt reported in their book value capital structures. Because of these companies' large size and the extreme nature of their capital structure data, it is likely that their inclusion in the Value Line industrial composite the CLECs use has a significant impact on the reported book capital structure value.

**D. Financial Research Does Not Support the Conclusion that the Market Value of Equity Moves toward Book Value in the Long Run.**

45. The CLECs incorrectly claim that the financial literature supports the conclusion that the market value of equity tends to move toward book value in the long run. For this notion, the CLECs cite to articles by Fama and French and Lakonishok, Shleifer, and Vishny. AT&T Comments, Murray Decl. ¶ 115 n.71. However, these articles make no such claim. The articles claim that the market-to-book ratio is a variable that may predict future returns earned by investors in the marketplace. However, this research is based on the statistical relationship between market-to-book ratios and market rates of return, and is not based on or related to any claim or evidence that market-to-book ratios tend toward 1.0 over time. Thus, none of the cited articles "validate book equity as a measure of a firm's long-run target capital structure," as the CLECs claim. AT&T Comments, Murray Decl. ¶ 115.

46. As further evidence that market-to-book ratios do *not* tend towards 1.0, I have

examined the market-to-book ratios of companies in the Value Line universe. In December 2003, the average market-to-book ratio for 1,610 companies in the Value Line universe was 3.95. The average market-to-book ratios of the four quartiles of this universe of companies were 1.24, 2.05, 3.10, and 9.37. This evidence suggests that the general tendency is for market value to exceed book value by a significant margin. Even the lowest quartile of companies had market-to-book ratios averaging 1.24. In my experience, market-to-book ratios in the range 1.24 to 9.37 are typical for companies in the Value Line universe.

**VI. The S&P Industrials Are the Best Proxy for the Purpose of Estimating the Cost of Equity.**

47. In my initial declaration, I explained how the cost of equity for use in UNE cost studies can be measured by applying the single-stage DCF model to the S&P Industrials. Further, I explained that the S&P Industrials are the best proxy because they represent a large sample of companies operating in competitive markets and meet the following criteria required for the selection of a reasonable proxy group: (1) the companies must have stock that is market traded; (2) the companies must have sufficient data to apply cost of equity methodologies, *i.e.*, dividends and I/B/E/S growth rates; (3) taken as a whole, the group of companies must reflect average competitive market risk; and (4) the group of companies must be sufficiently large in number to reduce random noise in the estimation process to an acceptable level.

48. CLECs argue that the cost of equity can be estimated by applying the three-stage DCF model to the RBHCs. AT&T Comments, Murray Decl. ¶¶ 83-86; MCI Comments, Kahal Decl. at 16-18; AT&T Comments, Hubbard & Lehr Essay at 4-9. However, the RBHCs are poor proxies for the purpose of estimating the UNE cost of equity. As I explained in my initial declaration, the RBHCs are less risky than the wholesale UNE provider because they can diversify away many of the technology, geographic, and regulatory risks that the UNE provider

faces when it invests in the network to provide UNEs. In addition, the three RBHCs that still pay dividends are simply too small a sample for the purpose of reliably estimating the cost of equity. Finally, traditional cost of equity models are based on the assumption that the target company operates in a stable environment where investors can reasonably predict future rates of return and risk. Thus, traditional cost of equity models cannot be reliably applied to companies such as the RBHCs that are experiencing dramatic industry restructuring that threatens the historic core of their business, wireline telephony.

49. Nothing the CLECs say provides any reason that using the S&P Industrials would *not* be a reasonable proxy. I note that even SBC, which proposed using the RBHC holding companies in the DCF model, does not propose doing so without adjustment: in the states, for example, I understand that although SBC uses RBHC data, it uses that data from 1999, to avoid the problem I identify of applying the DCF to companies that are in the midst of a dramatic restructuring.

## **VII. The Cost of Equity Should Be Estimated by Applying the Single-Stage DCF Model.**

50. As I showed in my initial declaration, the single-stage DCF model applied to the S&P Industrials is the best way to determine the cost of equity for UNE rates. Vander Weide Decl. ¶¶ 52-62. The CLECs argue, however, that the three-stage DCF model should be used instead. They contend that the three-stage DCF is superior to the single-stage DCF, because the latter irrationally assumes that firms can grow forever at rates in excess of the rate of long-run growth in the economy. But the CLECs are wrong for several reasons: (1) the DCF model requires the use of investors' expectations, whether the CLECs deem those expectations rational or not; (2) the single-stage DCF model is a reasonable basis for estimating the cost of equity even if firms cannot grow at rates exceeding the GNP growth rate forever; and (3) the I/B/E/S

growth rates used in the single-stage DCF model are consistent with the sustainable or internal growth rates that investors frequently use to estimate expected growth. Vander Weide Decl.

¶ 58. Thus, the single-stage DCF model approximates *investors'* real expectations. By contrast, the CLECs have no valid basis for the growth rates they propose in their three-stage model and cannot show that those growth rates are reasonably aligned with investor expectations.

51. In previous testimony before the Wireline Competition Bureau, I presented evidence that while the single-stage DCF model is consistent with the fundamental principle that higher risk requires a higher return and with the growth expectations that are used to determine stock prices in the real-world, the three-stage DCF model produces counterintuitive results, yielding lower returns for higher risk companies. I have updated my studies of the relationship between DCF results and risk using data for December 2003 in order to confirm that my evidence and conclusions are still valid.

52. First, I performed a regression analysis of the relationship between the three-stage DCF model results for companies in the S&P 500 and their Value Line betas. Although beta is not a perfect measure of risk, one would expect that any cost of equity estimate that reflects investors' expectations would at least be positively correlated with beta. The resulting regression statistics are shown below in Table 5. As those results show, the coefficient for the beta variable is negative, demonstrating that the three-stage DCF model produces *lower* DCF results for companies that have *higher* risk as measured by beta. This result is counter to the basic financial principle that investors demand a higher rate of return on investments with greater risk.

**Table 5**  
Regression of CLECs' Three-Stage Model DCF Results  
vs. Value Line Betas

	Intercept	Beta	Adjusted R Square	F
Coefficient	0.095	-0.009	0.022	8.269
T Statistic	27.677	-2.876		

53. I also performed a similar regression analysis for the single-stage DCF model. The resulting regression statistics are shown below in Table 6. In the case of the single-stage model, the regression coefficient is positive and significant, demonstrating that the single-stage DCF model produces higher DCF results for companies that have higher risk as measured by beta. Thus, the single-stage DCF model is consistent with the risk/return principle, while the three-stage DCF model is not.

**Table 6**  
Regression of Constant Model DCF Results  
vs. Value Line Betas

	Intercept	Beta	Adjusted R Square	F
Coefficient	0.103	0.028	0.063	23.170
t Statistic	16.907	4.814		

54. Second, I performed a regression analysis of the relationship between three-stage DCF model results and companies' dividend yields. Since high dividend yield companies are generally recognized as having lower risk (other things being equal) than companies with low dividend yields, one would expect the DCF results for high dividend yield companies to be lower than the DCF results for low dividend yield companies (that is, there should be a negative relationship between DCF results and dividend yield). However, contrary to expectation, the data in Table 7 show a positive and significant coefficient for the dividend yield variable, indicating that there is a positive relationship between the three-stage DCF results and dividend

yields for companies in the S&P 500. Again, the CLECs' recommended three-stage DCF method produces results that are contrary to the expectation that companies with higher risk (that is, those that have lower dividend yields) have higher DCF results.

**Table 7**  
Regression of CLEC Three-Stage Model DCF Results  
vs. Dividend Yield

	Intercept	Dividend Yield	Adjusted R Square	F
Coefficient	0.067	0.952	0.807	1,401.064
t Statistic	103.399	37.431		

55. In contrast, as shown in Table 8, there is a significant negative relationship between the results of the single-stage DCF model and dividend yield. Thus, the single-stage DCF model produces results that are consistent with the expectation that companies with higher risk, as measured by lower dividend yield, have higher DCF results.

**Table 8**  
Regression of Constant Model DCF Results  
vs. Dividend Yield

	Intercept	Dividend Yield	Adjusted R Square	F
Coefficient	0.144	-0.621	0.100	38.085
t Statistic	56.891	-6.171		

56. As a third test of whether the three-stage model produces reasonable results, I performed a regression analysis of the relationship between three-stage DCF results and expected growth. Financial practitioners generally recognize that companies with higher expected growth are riskier than companies with lower expected growth, indicating that there should be a positive relationship between DCF results and growth. Contrary to this reasonable expectation, however, the regression results for the three-stage DCF model, shown in Table 9, illustrate that the coefficient on the expected growth variable is negative, indicating that companies in the S&P



500 with higher expected growth and therefore higher risk have *lower* three-stage model DCF results.

**Table 9**  
Regression of CLECs' Three-Stage Model DCF Results  
vs. Analysts' Expected Growth

	Intercept	Expected Growth	Adjusted R Square	F
Coefficient	0.103	-0.160	0.134	52.824
t Statistic	40.376	-7.268		

57. In contrast, the regression results for the single-stage DCF model, shown in Table 10, display a positive coefficient for the expected growth variable, indicating that companies with higher expected growth have higher single-stage DCF results. Again, the single-stage DCF model produces results that are consistent with the principle that higher risk has a higher required return, while the three-stage model does not.

**Table 10**  
Regression of Constant Model DCF Results  
vs. Expected Growth

	Intercept	Expected Growth	Adjusted R Square	F
Coefficient	0.052	0.723	0.841	1,761.936
T Statistic	25.806	41.975		

58. As a final test of the performance of the three-stage and single-stage DCF models, I compared the abilities of each model to predict stock prices. According to DCF theory, a company's price/earnings ratio should be positively related to both its dividend payout ratio and investors' expected growth rate for each company. Thus, a strong correlation between investors' expected growth rates and price/earnings ratios suggests that investors use that expected growth rate in making stock buy and sell decisions. To test whether investors use the I/B/E/S growth rates or the average growth rates used in the CLECs' three-stage model in valuing stocks, I

performed a regression analysis with regression equations of the form:

**Equation 1**

$$P/E = a_0 + a_1 D/E + a_2 g_{IBES} + e$$

**Equation 2**

$$P/E = a_0 + a_1 D/E + a_2 g_{3-Stage} + e$$

where:

P/E	=	the company's price/earnings ratio reported by Value Line
D/E	=	the company's dividend payout ratio
$g_{IBES}$	=	the company's I/B/E/S growth rate
$g_{3-Stage}$	=	the company's average growth rate in the CLECs' three-stage DCF model
$a_0 - a_2$	=	regression coefficients
e	=	random error term

These equations, which are derived directly from the DCF model, are obviously identical except for the measurement of the growth term. Equation 1 uses the I/B/E/S long-term growth rate to measure investors' growth expectations, and Equation 2 uses the average growth rate implied by the CLECs' three-stage growth model.

59. If investors use the results produced by the single-stage DCF model with the I/B/E/S growth rate in making stock buy and sell decisions, then the R-square statistic<sup>12/</sup> for Equation 1 (the equation including the I/B/E/S growth rate rather than the 3-stage growth rate) should be significantly higher than the R-square statistic in Equation 2 (the equation including the 3-stage growth rate). In addition, the coefficient for the I/B/E/S growth rate in Equation 1 should be positive; and the t-statistic for the I/B/E/S growth rate in Equation 1 should be both significantly greater than 2 and higher in absolute value than the t-statistic for the 3-stage growth

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<sup>12/</sup> The R-Square statistic measures what percentage of the variability in the dependent variable (*i.e.*, the price/earnings ratio) can be explained by variability in the independent variables (*i.e.*, dividend yield and growth).

rate in Equation 2. On the other hand, if investors use the average growth in the CLECs' three-stage DCF model in making stock buy and sell decisions, then the R-square statistic for Equation 2 should be significantly higher than the R-square statistic for Equation 1. In addition, the coefficient for the three-stage growth rate should be positive, and the t-statistic for the three-stage growth rate should be both greater than 2 and higher in absolute value than the t-statistic for the I/B/E/S growth rate in Equation 1.

60. The regression results for Equations 1 and 2 are summarized in Tables 11 and 12 below. As shown in these tables, regression Equation 1, with the I/B/E/S growth rate, significantly out-performs regression Equation 2, with the average three-stage growth rate. In particular, the R-square statistic for Equation 1 with the I/B/E/S growth rate is 0.303, as compared to an R-square statistic for Equation 2, containing the three-stage growth rate, of only 0.026. In addition, the coefficient of the I/B/E/S growth rate is positive, as expected, and the t-statistic of the I/B/E/S growth coefficient, 11.842, is both greater than 2 and significantly greater than the t-statistic, 2.457, for the 3-stage growth rate shown in Table 12.

**Table 11**

Regression of P/E ratios versus Dividend Payout and I/B/E/S Growth Rate

	Intercept	Dividend Payout	I/B/E/S Growth	Adjusted R Square	F
Coefficient	-2.094	0.144	1.439	0.303	73.588
T Statistic	-1.191	8.368	11.842		

**Table 12**

Regression of P/E ratios versus Dividend Payout and Three-Stage Growth Rate

	Intercept	Dividend Payout	Three- Stage Growth	Adjusted R Square	F
Coefficient	6.950	0.040	1.592	0.026	5.504
T Statistic	1.618	2.281	2.457		

61. These data demonstrate that the single-stage DCF model with the I/B/E/S growth rate is superior to the CLECs' three-stage DCF model in explaining investors' stock buy and sell decisions. Specifically, the high correlation between the I/B/E/S growth rates and stock prices is consistent with the hypothesis that investors use the single-stage DCF model with I/B/E/S growth rates when making stock buy and sell decisions. The low correlation between the average growth rate of the three-stage model and stock prices is *inconsistent* with the hypothesis that investors use the three-stage model with the CLECs' assumed pattern of growth rates in making stock buy and sell decisions.

**VIII. The Commission Should Not Use the Capital Asset Pricing Model (CAPM) to Estimate the Cost of Equity Input in UNE Cost Studies.**

62. The CLECs recommend that the cost of equity input in UNE cost studies can also be estimated through application of the CAPM. However, as described in my initial declaration, there are significant problems in using the CAPM to estimate the cost of equity. First, the CAPM is a model that assumes that the required returns on a company's stock are sensitive only to variations in the return on the market portfolio consisting of all risky investments. Financial research has demonstrated that investors' required returns are, in fact, sensitive to multiple risk factors that are not captured in the CAPM equation. Some studies demonstrate that investors' required returns are sensitive to individual company characteristics such as the company's market-to-book ratio, size, and operating leverage.<sup>13/</sup> Other studies demonstrate that investors' required returns are sensitive to liquidity, interest rates, industrial production, expected and

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<sup>13/</sup> See, e.g., Fama and French, "The Cross Section of Expected Stock Returns," *Journal of Finance* 47 (1992), pp. 427 – 65; B. Lev, "On the Association Between Operating Leverage and Risk," *Journal of Financial and Quantitative Analysis*, IX (September 1974), 627–42.

unexpected inflation, and the value of human capital such as education.<sup>14/</sup> While there is considerable debate about the additional factors that should be included in investors' return requirements, there is little doubt that the CAPM fails to capture many of the risks that determine investors' return requirements.

63. Second, the CAPM contains three inputs that are inherently difficult to estimate. The risk-free rate is difficult to estimate because the CAPM is a single period model, while in reality investors make investment decisions lasting for many periods. As a single period model, the CAPM provides no guidance on how to measure the return on a risk-free security over the life of a typical investment. The equity beta input is difficult to estimate because it is intended to reflect investors' expectations regarding the covariation between the return on an individual security and the return on the market index, but data on such forward-looking expectations is not readily available. Instead, betas are typically measured from five years of historical data. For companies that are experiencing dramatic industry restructuring, such as the telecommunications companies, historical betas are inherently poor predictors of future betas because they do not capture future risk. Furthermore, the standard errors in the historical beta estimates for individual companies are so large that the historical betas for individual companies are generally statistically insignificant. The expected risk premium on the market portfolio is also difficult to estimate because of data limitations, and the current approaches for doing so remain controversial. Thus, the inputs to the CAPM are subject to significant uncertainty and the resulting cost of equity estimate is unreliable.

#### **IX. The Cost of Debt Should Be Measured Using the Yield to Maturity on A-rated Industrial Bonds.**

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<sup>14/</sup> See, e.g., Nai-Fu Chen, Richard Roll, and Stephen Ross, "Economic Forces and the Stock Market," *Journal of Business* 59 (1986).

64. The cost of debt should be measured using the yield to maturity on A-rated industrial bonds because the yield on these bonds reflects the current market interest rate the ILECs would have to pay on the bonds they would normally use to finance their investments in network facilities. The CLECs argue that the cost of debt component in UNE cost studies should be measured by the average yield to maturity on the debt shown on the RBHCs' balance sheets. However, the CLECs' recommendation fails to take into account that much of the long-term debt on the RBHCs' balance sheets is near to maturity and is now trading as short-term debt. Since the RBHCs would not finance the construction of a new telecommunications network with short-term debt, the inclusion of long-term debt that is now priced as short-term debt in the CLECs' yield to maturity calculation biases their estimate of debt cost downward. Furthermore, the lower yields to maturity on long-term debt that is now priced as short-term debt do not reflect the true interest cost being paid on this debt: the RBHCs pay the coupon rate on their debt whether the price of the debt goes up or down.

65. The CLECs also argue that the cost of debt in the UNE cost of capital should include the lower interest rate associated with current short-term debt balances on the RBHCs' balance sheets. The Commission should reject this argument because the ILECs use short-term debt primarily to finance working capital, and working capital is not included as an asset in UNE cost studies. Since working capital is not included in UNE cost studies, the cost of the short-term debt that is used to finance the investment in working capital should not be included in the cost of debt component of UNE cost studies.

**X. Lease Cancellation and Sunk Cost Risk Are Not Included In Market Estimates of the Cost of Capital.**

66. In my initial declaration, I explained that the impact of lease cancellation and sunk cost risk is not included in estimates of the market cost of capital because these risks arise

from the existence of options, and traditional cost of equity methodologies such as the DCF and CAPM are inherently incapable of valuing real option contracts. In contrast, the CLECs argue that any risk associated with lease cancellation and sunk cost is already included in the market cost of capital because capital markets are efficient, and the market price includes all information available to investors. The CLECs fail to recognize that their conclusion does not follow from their premise: it is possible for information regarding options to be included in the market price, but *not* in the cost of capital derived from the DCF and CAPM equations because these equations inherently do not reflect the value of option contracts.

67. The DCF model, for example, is based on the premise that the value of a company's stock,  $P$ , is equal to the present value of the expected cash flows available for payment to stock investors:

### EQUATION 3

$$P_s = \frac{CF_1}{(1+k)} + \frac{CF_2}{(1+k)} + \dots + \frac{CF_n + P_n}{(1+K)^n}$$

where:

- $P_s$  = Current price of the firm's stock;
- $CF_1, CF_2 \dots CF_n$  = Expected annual net cash flow available to investors;
- $P_n$  = Price per share of stock at the time the investor expects to sell the stock; and
- $k$  = Return the investor expects to earn on alternative investments of the same risk, i.e., the investor's required rate of return.

However, this equation can only be used to value a company's stock when the company behaves passively, that is, it has no real options to make decisions at a later point in time that affect its future cash flows. In the presence of real options (including the option to delay investment until uncertainty is resolved and the option to cancel lease payments), the value of the firm's stock can

not be equated to the sum of the present value of the expected cash flows available to investors. Rather, the value of the stock must be determined using the equations of option pricing theory, which do not resemble the discounted cash flow equation shown above. Thus, the cost of equity (the “ $k$ ” from the DCF equation), in the presence of options, cannot be determined simply by solving for the value of  $k$  in the DCF equation.

68. In summary, the cost of equity derived from traditional cost of equity methodologies such as the DCF and CAPM does not compensate investors for lease cancellation and sunk cost risks because these risks are associated with real options that are not valued in those equations. As Brealey and Myers state:

Discounted cash flow (DCF) implicitly assumes that firms hold real assets passively. It ignores the options found in real assets - options that sophisticated management can act to take advantage of. You could say that DCF does not reflect the value of management. *Principles of Corporate Finance*, 6<sup>th</sup> edition, p. 622

Remember that the DCF valuation method was first developed for bonds and stocks. Investors in these securities are necessarily passive: with rare exceptions, there is nothing investors can do to improve the interest rate they are paid or the dividends they receive. A bond or common stock can be sold, of course, but that merely substitutes one passive investor for another.

Options and securities which contain options, such as convertible bonds, are fundamentally different. Investors who hold options do not have to be passive. They are given a right to make a decision, which they can exercise to capitalize on good fortune or to mitigate loss. This right clearly has value whenever there is uncertainty. However, calculating that value is not a simple matter of discounting. Option pricing theory tells us what the value is, but the necessary formulas do not look like DCF.

Brealey and Myers, *Principles of Corporate Finance*, 6<sup>th</sup> edition, p. 622. Although the Brealey-Myers’ argument was made in the context of valuing internal investment projects, their argument also applies to stock investments because the net cash flows available to stock investors are simply the sum of the net cash flows from all of the firm’s internal investment projects. Thus, if the DCF equation cannot be used to value internal investment projects in the presence of real



options, it cannot be used to value the net cash flows to investors in the presence of real options. If the DCF equation is used in the presence of real options, the resulting cost of equity will always be understated because while it will account for normal competitive risks, it will not reflect the additional risks associated with options.

**XI. The ILECs Do Not Have an Opportunity To Recover Their Forward-Looking Economic Costs Under the Current TELRIC Standard.**

69. Under the current TELRIC standard, UNE rates are based on the forward-looking economic cost of reconstructing the telecommunications network using the least-cost technology. If the ILECs' network investment is depreciated over a period of 15 or more years, at the same time that rates are re-set every three or four years to reflect the allegedly lower cost of newer technologies, the ILECs will obviously have no opportunity to recover the investment cost assumed in the UNE cost model. I illustrated this obvious conclusion in my initial declaration, and Commission economist Dr. Sharkey proves this conclusion more rigorously in his working paper, "Dynamic Pricing and Investment from Static Proxy Models," David M. Mandy and William W. Sharkey.

70. Despite the overwhelming logic behind the conclusion that TELRIC prevents the ILECs from recovering their forward-looking economic cost of providing UNEs, the CLECs continue to insist that TELRIC provides the ILECs an opportunity to recover all relevant economic costs. AT&T Comments, Willig Decl. ¶ 21; AT&T Comments, Baumol Essay at 7-9. To prove this, the CLECs point to a simple static example that fails to capture the dynamics of real world investment decisions. In the CLECs' example, the ILECs make a \$100 investment that declines in value to \$75 when new lower-cost network technologies become available. If initial rates were set at \$10 to produce a 10% rate of return on investment, the CLECs argue that the ILECs can still earn a 10% rate of return (on the lower \$75 value of their investment) if rates

are reduced to \$7.50. Although the CLECs' example recognizes that the value of the ILECs' initial investment has declined by 25%, they argue that this decline can be ignored — and recovery of the original full \$100 is not an issue — because the ILECs' \$100 initial investment is “sunk.”

71. This example is entirely irrelevant to the problem of repeated rate-setting in the TELRIC context, however. UNE cost models are based on the assumption that all network investment and expense values are forward-looking; yet if rates are repeatedly reduced under TELRIC, the incumbent is deprived of its opportunity to recover even the “new,” *forward-looking* investment approved in the prior rate case. That becomes clear if we alter the CLECs' example slightly by assuming that the ILECs' \$100 investment is forward-looking, that is, has just been approved in a UNE rate case. In this case, assuming a 15-year depreciation period and a 10% rate of return, initial TELRIC rates would have to equal \$13.15 per year for the ILEC to recover its \$100 investment and earn a 10% rate of return on that investment.<sup>15/</sup> Suppose, as in the CLECs' example, that in year three, a new technology becomes available that allows the network to be reproduced for \$75. The annual TELRIC revenue that amortizes the \$75 investment in the new network over a 15-year period is \$9.86 per year. However, if the ILEC receives only \$9.86 per year for years four through fifteen, it cannot recover the \$100 investment approved when rates were first set. Thus, it is clear from this example that the ILEC has no opportunity to recover its forward-looking economic cost under the TELRIC standard.


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<sup>15/</sup> For simplicity, we assume that operating expenses are zero.

**Declaration of James H. Vander Weide**

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 28<sup>th</sup> day of January, 2004.

  
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James H. Vander Weide